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information on certain subjects as we have now. During the last three or four years we have been very busy in rewriting all of our older courses. These new courses will cover the subjects more completely than the older ones did, and there will be a larger number of subjects than were included in the former courses. Inasmuch as the new courses will meet the demands of our students better than the old ones did, we expect that there will be a great increase in the number of students finishing such courses, or, at any rate, in the number of students studying a part or all of the courses.

J. J. CLARK.

THE PRESENT NEEDS OF THE HARVARD MEDICAL SCHOOL.¹

EVERY one who has visited the new buildings on Longwood Avenue must feel that, so far as spacious and well-lighted laboratories are concerned, the Harvard Medical School has all the laboratory space which it will require for many years to come. What it needs now, so far as these laboratory buildings are concerned, is sufficient endowment to equip, man and run them in a manner commensurate with the laboratory opportunities afforded. The school has at the present time but a small endowment fund. A much larger one is necessary, because it is becoming more and more difficult every year to induce capable men to enter the laboratory branches of medicine. This failure to take up laboratory work as a profession is due chiefly to the salaries, which, in consequence of the greatly increased cost of living and the greater returns offered by clinical branches of medicine or by business, have become entirely inadequate. No man can live in a manner becoming the position on the salaries now paid in the laboratory departments.

¹ Read before the Harvard Medical Alumni Association at its annual meeting, June 26, 1906.

The laboratory departments have, however, this advantage over the clinical departments. They have the laboratories and so can call the ablest men from any part of the world to work and teach in them. There is nothing to prevent these departments from attaining the highest rank except a lack of endowment sufficient to attract the best men and to provide funds for necessary expenses. With this provision the best results, both as regards the education of students who are to practise in the community, as regards men trained to become the medical teachers of the future, and as regards advancing medical knowledge and investigation, can be produced.

Much as adequate endowment for the laboratory departments is needed, however, lack of endowment for these departments is not the greatest need of the school at the present time. First-class laboratory departments alone will never make a great medical school. The first function of a medical school is to turn out thoroughly trained practitioners of medicine, and to do that the clinical departments must have opportunities equal to or even greater than the laboratory departments. This is not the case at present. The clinical teachers labor under great disadvantages, owing to the fact that the medical school does not have a hospital of its own and with possibly one exception has no power of appointment of clinical men in a hospital. Consequently the clinical instructors have to do their teaching in the various hospitals of Boston, which all are under different boards of management. These boards are entirely independent of the school and some of them are little inclined to cooperate with it. The resulting difficulties, which most of the clinical teachers have to contend with, are short terms of hospital service; variability in the time of year of hospital services, especially for the younger men; and the inability of the heads of departments to

select their teaching assistants in the hospitals.

In consequence of the short terms of service in the hospitals (usually four months) the clinical teachers do not have patients under their own control throughout the school year. As a result of this condition two and often three men are needed to give the same amount of instruction that is given by one man in the laboratory departments, *i. e.*, teach the eight months of the school year. As a result of the large number of men necessarily appointed by the school under these conditions the value of a teaching position is much diminished, because the salary which can be paid to each instructor is exceedingly small and because the indirect pay received in consequence of connection with the school is by no means so great as it used to be when the relative number of instructors was much less than at present.

The months during which a man is on duty in a hospital vary from year to year. Only the older clinicians are reasonably sure of certain months. A death or a resignation may cause a shift of the time of service for several men on the medical or surgical side of a hospital. On this account it is difficult for the heads of the clinical departments to plan in detail their course of instruction for the school year and for the summer. These difficulties hold in an even more marked degree for their subordinates.

Unless the heads of the clinical departments in the school are also heads of the clinical services in the hospitals they cannot choose their hospital assistants, and even when they are heads of clinical services they do not have an entirely free choice; that is, it is impossible for them to select and use on their services the men best qualified to teach. They must take as their assistants those men who fall to their ser-

vice by the method of assignment at present employed. Under this condition of affairs they may have as assistants men not interested in teaching or with little or no ability in that direction. Moreover, as these younger assistants on a service change from year to year, it is impossible to have a thoroughly organized, trained and permanent teaching staff.

Some of these difficulties could be eliminated by making the services continuous, as is already the case at some of the hospitals, but other difficulties are inherent in the principle on which almost all hospitals in this country are run, namely, the selection of local men only to serve on their staffs. This leads me to speak of the most vital defect which now exists in the clinical departments of the Harvard Medical School. It is the extremely limited field of choice of clinical teachers.

Since the school has practically no power of nomination or of appointment in the hospitals of Boston, it must appoint as its clinical teachers men who already hold hospital positions. The hospitals select their men from the vicinity of the city of Boston only. The result is that the hospitals of Boston dictate all the clinical appointments in the Harvard Medical School and thereby limit the choice of all its clinical teachers to Boston.

Boston is altogether too small a field from which always to obtain the best teachers. No other departments in the university or in the medical school are thus limited. All except the clinical departments are able to select from any part of the country the man who is judged best fitted for a teaching position which becomes vacant.

The number of desirable clinical teachers is still further limited in two ways, by lack of teaching ability on the part of many who receive appointment to hospital staffs,

and by promotion in hospitals on the basis of seniority only. Hospitals for the most part select the men on their staffs on the basis of their ability as practitioners of medicine, not on their ability as teachers and investigators. As a result many hospital men are not desirable as teachers or are used with detriment to the instruction. Moreover, hospitals usually select men rather early in their careers, before they have shown whether or not they possess any marked ability as teachers or investigators. The clinical men once appointed are advanced almost invariably on the basis of seniority, so that in time every man becomes the head of a clinical service. This basis of promotion may put hospital services in the control of men uninterested in teaching or inefficient in their work. There is no method of advancing rapidly the strong man with ability as a clinician, teacher and investigator, or of weeding out the inefficient man. University development, however, is based on the vital principle of selecting the most capable young men obtainable anywhere and developing them rapidly to the limit of their capacity. As a result of this present policy of promotion in hospitals the school is sometimes obliged to select an inefficient man because he is the head of a clinic and neglect a capable young man who is subordinate to him.

The result of this marked limitation of the field of selection of clinical instructors is that the clinical teachers of the school are not always of the high grade desirable and otherwise obtainable, and the broadening influence due to the introduction of men with other standards and ideals from other parts of the country is prevented.

I do not deny in the least that the clinical teachers of Harvard have always held a high rank and that many of them have made valuable contributions to medical

knowledge. I only wish to point out that through circumstances over which the clinical men themselves have no control the school is unable to call to its service the exceptional clinical man from outside of Boston and put him in charge of patients. The reason of this condition of affairs is that the school has always been a parasite on the clinical men and indirectly through them on the hospitals for its clinical teaching; *i. e.*, while it has furnished its laboratory men with laboratory space and equipment, it has not provided its clinical men with wards and patients. It is only fair to add, however, that this teaching has cost the hospitals nothing and in many ways has been of advantage to them.

The medical school of the present day is no longer a place to train men solely for the business of the practise of medicine, but has become a technical school embracing many branches of science. As teachers of these different branches, trained men are needed, just as in any other technical school, *e. g.*, of engineering. In the clinical departments of most of the medical schools in this country the clinical teachers necessarily have had to make teaching a secondary part of their vocation. They have had to seek private practise in order to make a living. There have been open to clinical men no teaching positions which paid salaries large enough to enable men to live suitably and comfortably on their salaries alone; hence there has been no incentive for a man to fit himself for such a position. The only way in which a man could become a clinical teacher was by obtaining a hospital position.

At present there exists in most hospitals in this country no method for the thorough training of young men who wish to become clinical teachers. A hospital internship is not a sufficiently long experience, but it is all that is possible at present. Under

existing conditions, after their early hospital training, young clinical men are compelled to devote their energies to earning a living and to acquiring a practise, and it usually is several years before they receive hospital appointments, as a result of which they become available as teachers.

In consequence of the lack of proper, uninterrupted, early training under capable supervision, and as a result of the temporary want of extensive opportunity for bedside study and large experience at the most important period of his life, it is almost impossible for a clinical man to reach any commanding position as a teacher in his line of work until he is past middle life. This is not true in other lines of work.

There is no denying the fact that the Harvard Medical School has done little for its clinical men except to give them titles which might prove of value in private practise. It has paid them very small salaries and given them absolutely no assistance in their clinical teaching. The school has received from many of its devoted clinical men, some of whom have made great sacrifices for its sake and have brought it great honor and reputation, much more than it has given them.

Under present conditions, with the school giving its clinical instruction in hospitals which are under the control of others, with underpaid clinical teachers who have limited terms of hospital service, and who are unable to select from the hospital staff and from the internes, as their assistants, the men they consider best fitted to teach and to advance the knowledge of clinical medicine, the school has about reached its limit of development.

From now on the Harvard Medical School must have a new ideal to strive for, namely, well-paid clinical instructors whose chief interests shall be teaching and scien-

tific medical investigation. In other words, the clinical departments must be put on a true university basis like the laboratory departments and entirely freed from the outside influences which hitherto have controlled them. To render this ideal possible two things are absolutely necessary:

1. A sufficient endowment to enable the school to pay clinical teachers adequate salaries so that they can afford to devote all their time to teaching and to research work.

2. A hospital of its own, or one in which it has the power of appointment, in order that it can do the following things: (a) Furnish continuous services to its clinical teachers. (b) Establish salaried teaching positions in the wards for young clinical men who will have charge (under the supervision of visiting men) of the medical students, who will carry on scientific investigation of clinical cases based on the broadest training in laboratory methods, and who will study to fit themselves to be the clinical teachers of the future. (c) Enable the clinical departments to call the exceptional clinical man from any part of the world and put him in control of ward patients. (d) Place students, after they have received sufficient preliminary training, in the wards as a part of the hospital machinery so that they all may acquire practical experience under proper supervision before they undertake to practise medicine on their own responsibility.

To demand such possibilities is perfectly reasonable. Germany owes her great clinical teachers to such a system of being able to call to any vacant clinical position the best available man in the country. Consequently men fit themselves by years of study in the hospitals to fill these clinical positions. At least two medical schools in this country have adopted the same system.

If the Harvard Medical School does not adopt some such policy it will not be able to hold a leading position in this country like the other departments of the university, but will remain a local institution, and we shall continue to hear, as often in the past, the fatal excuse of expediency instead of commanding ability urged in behalf of a clinical man's appointment.

F. B. MALLORY.

HARVARD MEDICAL SCHOOL.

SCIENTIFIC BOOKS.

A Text-book of Sanitary and Applied Chemistry: or The Chemistry of Water, Air and Food. By E. H. S. BAILEY, professor of chemistry, University of Kansas. New York, The Macmillan Company. Pp. xx + 345. \$1.40.

The purpose of this text-book on applied chemistry is best stated in the author's own words:

A knowledge of the relations of health to pure air, unpolluted water, and wholesome food will have much to do with improvement of sanitary conditions, not only of students themselves, but, through them, of the people at large. The air is usually said to be free, but pure air and sunshine cost money, as the crowded tenements show. The best lighted and ventilated rooms are worth the most. * * *

It is certainly time that the people should have some practical knowledge of food and medicine. Without this knowledge they will continually be imposed upon by those who have something to sell which may be worthless as a food, or dangerous as a medicine. * * *

Schools and colleges are beginning to see their opportunity to impart a kind of knowledge that is practical and sane. * * *

A thorough understanding of the facts of applied chemistry will not make the skilled workman, nor will the theories of chemistry make the accomplished cook, but a broad and thorough knowledge of the underlying principles will go very far toward developing common sense in hygiene and in the selection and preparation of food.

In fulfilling his purpose, the author in Part I. (one third of the book) discusses air and fuels in their relation to heating and ventila-

tion, lighting by the various agents now in use, water supply and purification, disposal of household waste; he devotes a chapter to cleaning, soaps and bluing, and another to disinfectants.

In view of the fact that physicians are agreed that fresh air is the first requisite to maintaining or regaining health, it is fitting that the longest chapter in this part of the book should be given to the atmosphere. A partial analysis will serve to indicate the exhaustiveness with which the subject is treated: History of Atmospheric Theories, Composition of the Air, Methods for Analysis of Air, Carbon Dioxide in Free Air and in Closed Rooms, Effect of Impure Air on the System, Nitric Acid and Other Impurities, Ozone and its Properties, Effect of Carbon Monoxide on the system, Methods of Studying the Dust of the Atmosphere, Bacteria in City Air, Arsenic in the Air, Injurious Trades, Composition of Ground Air, Effects of Ground Air on the System, Offensive Gases.

Part II. deals with food, food materials, food accessories, preservatives, beverages and dietaries.

The method of treatment is substantially as follows: history, statistics of production and consumption, classification of various forms of a given food material, chemical composition, physical properties, methods of preparation in edible form, food value.

The lists of adulterants to be looked for and the tests to discover them constitute a timely feature.

The book contains valuable tables of composition, numerous well-chosen experiments for the student, and an extremely good, though not exhaustive, bibliography.

The style of the book and the directions for experiments, while terse, are always clear.

The plan is admirably adapted to the use of students in the higher schools, academies, agricultural colleges and technical schools. The progressive college may for once waive its fear of applied science, and welcome a book so suggestive of lines of research. It is much to be desired that every college will at least have the book in its reference case.